



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY AND ENGINEERING ORGANIZATION
10701 PARKRIDGE BLVD.
RESTON VIRGINIA 22091-4398



IN REPLY
REFER TO

Center For Standards

17 September 1996

Memorandum for Distribution

SUBJECT: Minutes - Symbology Standards Management Committee (SSMC) Meeting,
17 September 1996

1. Introduction. The Symbology Standards Management Committee (SSMC) meeting was called to order at 0830 hours, 17 September 1996, by the Chair, CDR Rocky Wells, Syntax and Symbology Division, Center for Standards (CFS), Joint Interoperability and Engineering Organization (JIEO), Defense Information Systems Agency (DISA). Thomas Beal, Logicon JIEO

support, welcomed the committee and began introductions. The following voting member organizations were represented by the individuals listed:

Assistant Secretary of Defense for Command,
Control, Communications, and Intelligence
Central Imagery Office
Chairman, Joint Chiefs of Staff
Chief of Staff, U.S. Air Force
Chief of Staff, U.S. Army
Chief of Naval Operations
Commandant of the Marine Corps
Commander in Chief, U.S. Atlantic Command
Commander in Chief, U.S. European Command
Commander in Chief, U.S. Central Command
Commander in Chief, U.S. Pacific Command
Commander in Chief, U.S. Southern Command
Commander in Chief, U.S. Space Command
Commander in Chief, U.S. Special Operations Command
Commander in Chief, U.S. Strategic Command
Commander in Chief, U.S. Transportation Command
Department of Transportation, U.S. Coast Guard
Director, Defense Intelligence Agency
Director, Defense Mapping Agency

Mr. Rajan
LTC Roper
Mr. McKinnon
LTC Salice
Mr. Pucci
Maj Krivdo

Mr. Gleason

The roster of attendees is provided in enclosure 1.

2. Approval of previous meeting minutes. The Chair presented the 7 July 1996 meeting minutes and asked for recommended changes. No changes were offered, and the minutes were approved without change.

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3. Ad hoc meeting. The Chair provided a brief overview of the ad hoc meeting that was held 6 September 1996. This meeting focused on the draft Validation Test Plan. Dr. Fernandes redeveloped the Validation Test Plan following the meeting. Minutes will soon be distributed to the services.

4. New MDBS field. Mr. Bob Gyger advised the committee that the Intel community will be adding a new field to the MDBS--symbol ID. He stated that this would be an easy transition to incorporate into MIL-STD-2525A.

5. BBS access. Access to the BBS has been halted due to reorganization and redesign efforts. If anyone is having problems gaining access to this site, contact Thom Beal, Logicon, and he will help you gain access.

6. Old business. Thomas Beal, Logicon JIEO support, reviewed open action items.

Action Items:

***AI 96-4.** Report on symbol ID construction.* Symbols in appendix D of MIL-STD-2525A were reviewed. AI 96-4 remains open.

***AI 96-5.** Report on glossary of symbols.* Thomas Beal, Logicon JIEO support, reviewed the status of a glossary of symbols. AI 96-5 was closed.

***AI 96-6.** Collection of remaining symbols for inclusion in Version 2.* AI 96-6 was closed.

***AI 96-11.** Review of and comments on 29 May 1996 Draft MIL-STD-2525A glossary of symbols.* The Draft MIL-STD-2525A distributed to attendees at this meeting incorporates comments received by members of the SSMC. AI 96-11 was closed.

***AI 96-12.** Joint Communications "unacceptable symbols."* Mr. Bob Gyger briefed the members on his contact with the Army Tactical Communication System (ATCS) concerning joint communications symbols. He advised that the ATCS community is not interested in pursuing incorporation of their symbols into MIL-STD-2525A at this time. AI 96-12 was closed.

***AI 96-13.** LTC Roper to draft JCS 136 on Proposed Test Plan for MIL-STD-2525A, Common Warfighting Symbolology.* AI 96-13 was closed.

***AI 96-14.** Review Draft Proposed Validation Test Plan for MIL-STD-2525A and propose changes prior to next SSMC.* The services are to provide estimated cost and criteria regarding the proposed Validation Test Plan. Dr. Fernandes presented an updated Validation Test Plan that incorporated the services' responses to the previous version of the test plan (enclosure 2). It was suggested that in addition to the Validation Test Plan, an operational test plan be developed.

This plan would establish the software/hardware and provide operating systems and exercise programs. The Army's Prairie Warrior and the Navy's RIMPAC were recommended as potential programs to use as operational testing sites. LTC Salice was tasked to compose an Operational Performance Assessment Plan that would address these issues. This plan will be distributed through the symbology e-mail list for comment and will be discussed at the next SSMC meeting. AI 96-14 was closed.

***AI 96-15.** Development of a proposal for the SIGINT symbols prior to next SSMC. Bob Gyger and MAJ Wright to take action.* AI 96-15 was closed.

***AI 96-16.** SIGINT symbols to be added to MIL-STD-2525A.* Logicon presented the incorporation of the SIGINT symbols into MIL-STD-2525A. The National Security Agency representative requested to include the SIGINT symbols in MIL-STD-2525A or in the next published version. It was recommended that the SIGINT material be a later addition to the standard due to the fact that the standard is currently in SD-1 coordination. The group decided to include the SIGINT material as a change notice to MIL-STD-2525A. Change proposal MIL 94-216 will remain open. AI 96-16 remains open.

7. New business

Configuration Management Plan. The draft Configuration Management Plan was presented to the committee (enclosure 3). Members are to review the document and provide comments to symbol@itsi.disa.mil by 30 November 1996.

Comment follow up. Logicon presented MIL-STD-2525A comments that were received from the Navy (enclosure 4). These comments were reviewed by the group and will be adjusted within the standard.

SD-1 Coordination comments. To date, three comments have been received. One comment from the Info Trans (JEBB) advised that they are no longer involved. The Navy reported on the removal of "pending" from the glossary of definitions. The final comment was received from the Air Force/Weather Service requesting the addition of one additional weather symbol.

Releasability. The Chair advised that there have been several inquiries from national and international organizations to obtain a copy of MIL-STD-2525A Final Draft. After a formal vote, the committee considered and unanimously approved the full, unlimited releasability of MIL-STD-2525A.

8. Next meeting. The next SSMC meeting will be held at Logicon in Reston, VA, on 31 October and 1 November 1996.

9. New Action Items. The following is a list of new action items:

AI 96-17. LTC Salice will compose an operational test plan that will focus on the Army's implementation aspect of the symbology. He will distribute the plan through the symbology e-mail list (symbol@itsi.disa.mil) or by fax.

AI 96-18. Services are to develop comments to LTC Salice's draft operational test plan by the next SSMC meeting.

AI 96-19. ASPO will report a cost estimate and time line for getting GSD updated to MIL-STD-2525A.

AI 96-20. ASPO will provide a cost estimate and time line for preparing the ITT software specific to the "Option B" design presented by Dr. Fernandes in the 6 September 1996 ad hoc working group meeting.

AI 96-21. Members are to review the draft Validation Test Plan and provide feedback to LTC Roper within 2 weeks (1 October 1996) for closure on the issue.

AI 96-22. Comments on the draft Configuration Management Plan are to be prepared and returned to Logicon by 30 November 1996.

10. SSMC meeting adjourned. The Chair adjourned the SSMC meeting at 1215 hours on 17 September 1996.

Roger Wells, Commander, USN
Chair, Symbology Standards
Management Committee

Distribution
Enclosures

1. Attendee Roster
2. Draft Validation Test Plan
3. Draft Configuration Management Plan
4. Change Proposal List

DISTRIBUTION:

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USPACOM/J6I, ATTN: Major Frank Rossif, Systems Integration Division, Camp H.M. Smith, HI 96861

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ENCLOSURE 1

ATTENDEE ROSTER
Symbology Standards Management Committee Meeting
17 September 1996

Beal, Thom	Mr.	Logicon
Cincala, Steve	Mr.	Logicon
Dowd, Steve	Mr.	CNO N62
Fernandes, Kathy	Dr.	NRAD, Code 4222
Gleason, Daniel	Mr.	DMA
Gyger, Robert D.	Mr.	Intel Fusion PMO
Helmick, Bill	CW03, USN	NCTSI, N522
Herman, Scott	Mr.	ASPO Support
Keays, Ann	Ms.	MCCDC, Quantico
Krivdo, Mike	Maj, USMC	MCCDC, Quantico
Kukrus, Barbara	Ms.	Logicon
McKinnon, Rex	Mr.	HQ AFCA/TNBC
Paccone, Larry	Mr.	SI CIO (STSD)
Pucci, John	Mr.	SPAWAR
Rajan, S. Danny	Mr.	CIO STSD/ISD
Roper, Ned	LTC, USA	JCS, J6I
Roth, Michael	Mr.	GSO
Salice, Hank	LTC, USA	HQDA DAMO - FDQ
Schipani, Sal	Mr.	ARL
Scott, Leigh	Ms.	Logicon
Stachowski, Keith	Maj, USAF	NSA/K41T
Wells, Rocky	CDR, USN	JIEO/CFS

ENCLOSURE 2

Validation Test Plan for MIL-STD 2525 Common Warfighting Symbolology: I. Operator Performance Assessment

I. Objective

The purpose of the validation testing of MIL-STD 2525 warfighting symbolology is to evaluate its effectiveness in an operational environment. The validation will include both operator performance testing and an assessment of the symbolology in an operational exercise. The test plan presented here addresses the operator testing portion of the validation and describes procedures for assessing both automated and manual rendering of the symbols. This testing will determine if the new symbolology provides performance statistics (in terms of speed and accuracy) similar to those for existing symbol sets and if it causes significant confusability problems (e.g., mistaking friend for enemy) for operators.

II. Automated Test Procedure

Automated testing will be performed using existing tactical hardware and operational software and be conducted at various individual and joint service sites (see assumption #1). The software will be instrumented for performance recording so that it can present the test session and record operator responses. The test session will be conducted with the operator seated at normal viewing distance from the workstation monitor. While the focus of the validation will be to assess performance on workstations with high-resolution color monitors and under normal (i.e., standard office) ambient lighting, testing will also include various types and sizes of displays (e.g., low-resolution and monochrome) and other viewing conditions (e.g., bright daylight, low-light, dark-room).

The effectiveness of the new symbolology will be assessed by measuring operator performance in a symbol recognition task (see assumption #2). A description of the task (e.g., select all hostile air tracks) will be displayed on the workstation monitor. The operator will click on a Start button to present a set of symbols displayed on a map background and start the clock. The operator will select (i.e., click on) the symbols that match the task and then click on a Done button when finished to stop clock. The elapsed time and number of errors will be recorded, after which the next task description will be presented. The operator will perform symbol selection under time stress to simulate operational conditions and allow the opportunity for errors to occur (so that confusability problems can be identified).

The testing session will begin by presenting a series of symbol recognition tasks using current symbolology in order to obtain performance metrics for comparing the data collected on the new

symbology. Baseline performance will be measured using the symbol set with which the operator is already familiar (i.e., either "force domain" or "engagement domain" symbology). The operator will then be provided with training on the new symbology. The training will explain how the new symbols are constructed and provide sufficient practice for the operator to establish a base level of proficiency. The operator will then be given another series of symbol recognition tasks, this time using the new symbology.

The symbology will be presented on a tactical display representative of what the operator would encounter in a joint environment. The STANAG 4420 testing results along with guidelines from the human factors literature will be used as the basis for defining the symbol size, luminance (i.e., symbol/background contrast), color, and font under various viewing conditions. The operator will be tested on symbology at all levels of the symbol hierarchy (i.e., from most complex to most primitive); however, all of the symbols on a given display will be at the same level of the hierarchy. In addition, symbols will be positioned in operationally meaningful groups on each display, with distractor symbols that are similar in appearance to the target(s) included in order to identify potential confusability problems.

The assessment will measure performance with the new symbology when various elements of the tactical display are manipulated. A number of map products will be selected to represent the range of backgrounds upon which the new symbology will likely be displayed. It is expected that these backgrounds will range from single-color (e.g., open ocean displayed in black, gray, or blue) to detailed, multi-color (e.g., terrain elevation data) and include at least five levels of complexity. The presence of tactical graphics will be manipulated to determine the extent to which they impact performance on the symbol recognition task and are confusable with the new symbology. The assessment will measure operator performance when tactical graphics are absent, when they are present to a limited degree, and when they are used extensively. Finally, the symbology will be presented at varying levels of density in order to assess the impact of clutter and overlap among symbols on operator performance.

Testing will be conducted with enlisted and officer operators from each participating organization. Past experience with current symbol sets will be recorded in order to determine if the degree of familiarity with existing symbology has impact on performance with new symbology. Sufficient data will be collected to provide stable assessment of operator performance, and data analysis will include appropriate descriptive and comparative statistics calculated on each of the performance measures.

III. Manual Test Procedure

Manual testing will be performed in conjunction with the automated testing and limited to operators with experience in this form of symbol rendering. This part of the assessment will measure the extent to which the new symbology can be produced and recognized by operators. In one testing scenario, the operator will be given a template (or shown one of the automated

displays) containing elements from the symbol set and asked to draw them as quickly as possible. In another testing scenario, the operator will be given a set of hand-drawn symbols and asked to identify the entity represented. The symbology will be assessed in terms of the speed and accuracy of operator performance in the two scenarios.

IV. Schedule

It is estimated that the operator testing portion of the validation will require twelve months to execute, from the time funding is identified and the Symbology Standards Management Committee (SSMC) identifies an executive agent for performing the assessment (see assumption #3) until the results are reported back to the SSMC. The following schedule of key activities is provided:

Month 1: Identify an executive agent; prepare and approve detailed test plan; identify performance instrumentation software to be developed (see assumption #4).

Month 2-6: Complete development of instrumentation software; identify operational scenarios, create test protocols and training materials, arrange for distribution to test sites.

Month 7-10: Conduct data collection at test sites (assumption #5).

Month 11-12: Perform data analysis, prepare summary report, brief results to SSMC.

V. Budget

The cost of the software instrumentation task is estimated to be \$200K. In addition, each participating organization will have to contribute one labor-month of effort towards the development of operational scenarios and test protocols (to ensure that they represent the full range of operational settings in which the symbology is expected to be used).

The cost estimate for development of testing materials, data collection, analysis, and reporting is estimated to be \$600K. In addition, each participating organization will be expected to provide access to space, workstations, and operators and participate in the oversight of data collection efforts at each site during the testing period.

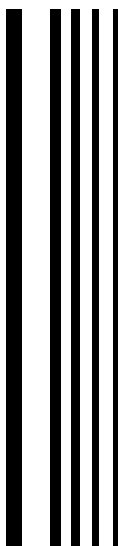
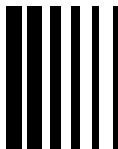
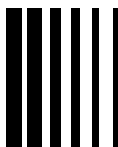
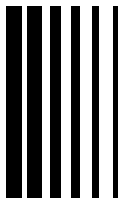
VI. Assumptions/Risks

1. The specific tactical hardware and software to be used in the validation testing has not yet been identified. One option would be to implement the symbology and add performance instrumentation capabilities to the mapping software in the Defense Information Infrastructure Common Operating Environment. The test suite could then be installed on any of the hardware configurations supported by the Global Command and Control System (GCCS), and each

participating organization could make use existing hardware to perform testing at any of its facilities where GCCS-based systems are installed. Another option would be to implement the symbology in one or more simulators in order to capitalize on performance measurement capabilities already resident in these systems; in this case, testing would be conducted at facilities where these simulators are currently available.

2. The current test plan assumes that training on the new symbology can be automated along with the rest of the data collection. The effectiveness of this approach in producing an acceptable level of proficiency with the new symbology will need to be determined. If automated training is found to be ineffective, it is possible that a data collection coordinator will be needed at each test site to deliver the symbol training and ensure the testing is conducted as planned. This form of oversight will increase the cost (in labor and travel) of the assessment and likely require an extension in the length of the data collection period.
3. The SSMC will identify an executive agent who has overall responsibility for performing the validation. The agent will prepare a detailed test plan, coordinate the development of instrumentation software and testing materials, provide oversight during testing, and produce the final test report. Members of the SSMC will approve the test plan prior to its implementation and receive periodic reports on test progress.
4. It is not known at this time whether access to source code will be required in order to develop the performance measurement module. If access is required, it may be necessary to award the task to the developer who "owns" that software, with the ability to complete the task according to the proposed schedule contingent upon developer availability. If access to source code is not required, the choice of developer will be less constrained; however, more time may be required to complete the task because the developer is unfamiliar with the software (resulting in possible slippage in the schedule).
5. Each participating organization will select the operators and locations for its portion of the validation testing. Locations are expected to include laboratory environments, command centers, simulation facilities, and field sites; operators may be specifically selected to participate in the data collection or may be included as part of a larger exercise (e.g., Prairie Warrior). The executive agent for the validation will monitor activities at the test sites to ensure that data collection is being conducted in accordance with the test plan.

ENCLOSURE 3



**JIEO PLAN 9002
SUPPLEMENT 2**

**DRAFT
SEPTEMBER 17 1996**

**DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY AND ENGINEERING
ORGANIZATION**

**DEPARTMENT OF DEFENSE
SYMBOLY
INFORMATION TECHNOLOGY STANDARDS
MANAGEMENT PLAN**

**SUPPLEMENT 2
CONFIGURATION MANAGEMENT**

DRAFT

FOREWORD

JIEO Plan 3200, Department of Defense (DOD) Information Technology Standards Management Plan (ITSMP), November 1993 (reference a), completed a step in the implementation of the Defense Information Systems Agency's (DISA's) Information Technology Standards (ITS) Executive Agent (EA) responsibilities. The *Symbology ITS Management Plan (SITSMP)* establishes the procedures and defines the responsibilities of implementing the guidance and direction of DOD's ITS EA, contained in JIEO Plan 3200, as they apply to symbology. The SITSMP establishes the Symbology ITS management process as the mechanism to provide the integration, coordination, testing, validation, and configuration management necessary to achieve, implement, and maintain information technology standards in the use and display of symbology. The goal of the process is to improve interoperability, effectiveness, and efficiency, and to reduce costs by applying uniform standards.

As a supplement to the *SITSMP*, this draft *Configuration Management Plan* establishes the procedures necessary to achieve symbology standardization through the configuration control of symbology in support of Command, Control, Communications, Computers, and Intelligence (C4I).

This supplement has been coordinated within DOD and other Federal departments and agencies on matters concerning the application of C4I symbology.

Director of Defense Information

DRAFT

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1. SCOPE

1.1 Scope. This plan defines how DISA, with support from the Commanders in Chief (CINCs), Services, and Agencies (C/S/As), will execute configuration management on the development of symbology in support of C4I system processes, practices, operations, services, interfaces, connectivity, interoperability, information formats, interchanges, processing, transmission, and transfer based on validated C/S/A functional needs. This plan encompasses ITS used to display C4I-related symbology for national security purposes during system development, testing, fielding, enhancement, and life cycle maintenance.

1.2 Purpose. The Symbology Configuration Management Plan establishes the configuration management (CM) processes to identify, develop, document, and implement changes to C4I symbology through the ITSMP. The CM process applies to the entire cycle of symbology-related documents from the initial development of baseline documents through the dissemination of changes and revisions to these documents.

1.3 Applicability. The provisions of this plan apply to all DOD components that acquire, use, and/or display symbology information, and to U.S. Government agencies outside of the DOD who have memorandums of agreement (MOAs) with the DOD to participate in the standardization of symbology information technology standards.

1.4 CM process. CM is a disciplined way of applying technical and administrative direction and surveillance to the life cycle of a configuration item (CI). The steps that help establish, define, and document the CM process are as follows:

- a. Identifying and documenting a CI in terms of the service description or functional requirements the standard should fulfill.
- b. Controlling and processing proposed changes to the CI through the submission of change proposals (CPs) and the approval of a configuration control board (CCB).
- c. Status accounting through a listing of the latest version of the standard and status of all CPs.
- d. Auditing the CI through testing to ensure that the standard and approved CPs fulfill the functional requirement.
- e. Establishing configuration baselines to ensure an orderly transition from one commitment point to another.

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1.5 References. References used to develop this plan are listed in appendix B.

1.6 Authority. The Secretary of Defense (SECDEF) is the DOD Corporate Information Management (CIM) authority. The Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD(C3I)) is the delegated authority for information technology policy, guidance, and administration, according to the 16 November 1990 Office of the Secretary of Defense (OSD) Memorandum, "Implementation of Corporate Information Management Principles" (reference b). In the 3 September 1991 ASD (C3I) Memorandum, "Executive Agent for DOD Information Standards" (reference c), the Director, DISA, is assigned the EA responsibility for coordinating and integrating all of DOD's information standards activities.

1.7 Policy.

1.7.1 Establishing CM for symbology. Symbology CM is established and exercised by DISA's Joint Interoperability and Engineering Organization (JIEO) Center for Standards (CFS) in conformance with applicable DOD management policies to achieve and maintain interoperability with the use and/or display of symbology.

1.7.2 Provisions of CM plan. This plan provides specific details for CM of symbology support applications, assigns responsibilities, and outlines the CP process.

1.8 Responsibilities. Established in conformance with JIEO Plan 3200 (reference a) and chartered by the Standards Coordinating Committee (SCC) (reference e), the Symbology Standards Management Committee (SSMC) is the CM forum for the development and maintenance of symbology. The responsibilities of the participants are listed in chapters 2 and 3.

1.9 Acronyms and Abbreviations. Acronyms and abbreviations used in this plan are listed in appendix A.

1.10 Security.

1.10.1 Protection of symbology documents. Record copies of the documents supporting the CM process are maintained and safeguarded according to applicable DOD regulations and directives.

1.10.2 Classification of symbology documents. Security classification and document dissemination procedures are performed according to the provisions of DOD Regulation 5200.1-R (reference f) and of any department or agency that is implementing these regulations.

1.10.3 Public release of information. The public release of symbology information is conducted according to the previously noted security classification guides. DOD Directive (DODD) 5230.9 (reference g) is the guide for the public release of other interface and management documents.

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1.11 Supersession. This document is the initial issue of the *Symbology CM Plan*.

1.12 Supplementation. CFS activities have the authority to supplement this plan as required. Other DOD activities must obtain the authority to supplement this document from the CFS Department for Information Standards.

1.13 Changes. Address proposed changes to the following:

DISA/JIEO/CFS
ATTN: Information Standards Department
Parkridge III, Room 3304
10701 Parkridge Boulevard
Reston, Virginia 20191-4357

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2. APPROACH

2.1 Overview. DISA/JIEO/CFS is responsible for maintaining symbology ITS documentation and identification, executing CCB decisions, providing administrative support for configuration control processes, and maintaining configuration accounting records. All CM changes to symbology development will be controlled using a formal CP process. Proposed changes will be submitted to the CFS, who will ensure that each CP is identified, accounted for, and entered into the review process. Following the review process, the CCB will approve or disapprove the CP. If the CP is approved, it will be entered into the change implementation process for modification and certification. As the focal point for establishing and maintaining symbology CM, the CFS will also oversee, maintain, and manage the Symbology Technical Library, which will contain the approved baselines for all C4I symbology activities.

2.1.1 Achieving CM goals. Full participation of the C/S/A and service technical staffs and the service laboratories is necessary to achieve CM goals. The CFS is responsible for coordinating the work effort, programming, and allocating necessary resources for implementing the symbology CM program.

2.2 CM program responsibilities. DISA has overall authority for the configuration management of symbology. To achieve interoperability within the development and maintenance of symbology, responsibilities have been assigned to appropriate committees, panels, and organizations. In the IT standards management structure, the Standards Coordinating Committee (SCC) is the primary DOD forum for IT standards matters. It is chaired by the Director of the CFS, which provides execution of the program. Subordinate to those groups is the Symbology Standards Management Committee (SSMC). The SSMC provides oversight, and accomplishes the majority of the symbology standards program activities. The SSMC is composed of representatives of the C/S/As and other members of the Federal government. The following responsibilities provide the direction and authority within configuration management.

2.2.1 SSMC responsibilities. The SSMC will function as the CCB for the CM of symbology. Throughout the remainder of this document, the group will be referred to as a CCB. The CCB will be the final authority for approval or disapproval of symbology change proposals, ensuring that all additions, changes, and deletions have been coordinated, certified, documented, and meet prescribed technical and functional requirements. The CCB is responsible for reviewing any recommendations of the Technical Review Panel (TOP) (see 2.2.3).

2.2.2 CFS responsibilities. The CFS is the focal point of all CM administration, documentation, configuration, identification, and accounting. The CFS is responsible for managing the Symbology Technical Library, including all records, updates, and changes needed to identify the baselines of the symbology under configuration management. CPs for symbology development and maintenance will be submitted by C/S/As and service technical staffs through the CFS. The CFS will provide technical and administrative support, as well as processing and accounting for the status of

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each CP. The CFS will prepare and electronically forward the CPs to all participants for review. The CFS will manage the symbology change proposal review process and is responsible for consolidating the comments of the C/S/As and executing the decisions of the CCB.

2.2.3 TOP responsibilities. If required, a TOP consisting of C/S/A technical representatives is established and chaired by the CFS. When implemented, the TRP will evaluate the technical feasibility of assigned problem statements or a CP and provide additional input and recommendations to the CCB. This information will be used in determining the approval or disapproval of the proposed change.

2.2.4 C/S/A responsibilities. C/S/As are responsible for originating CPs concerning symbology and submitting them to the JIEO. Figure 2-1 provides the organizational responsibilities for ensuring configuration management for symbology.

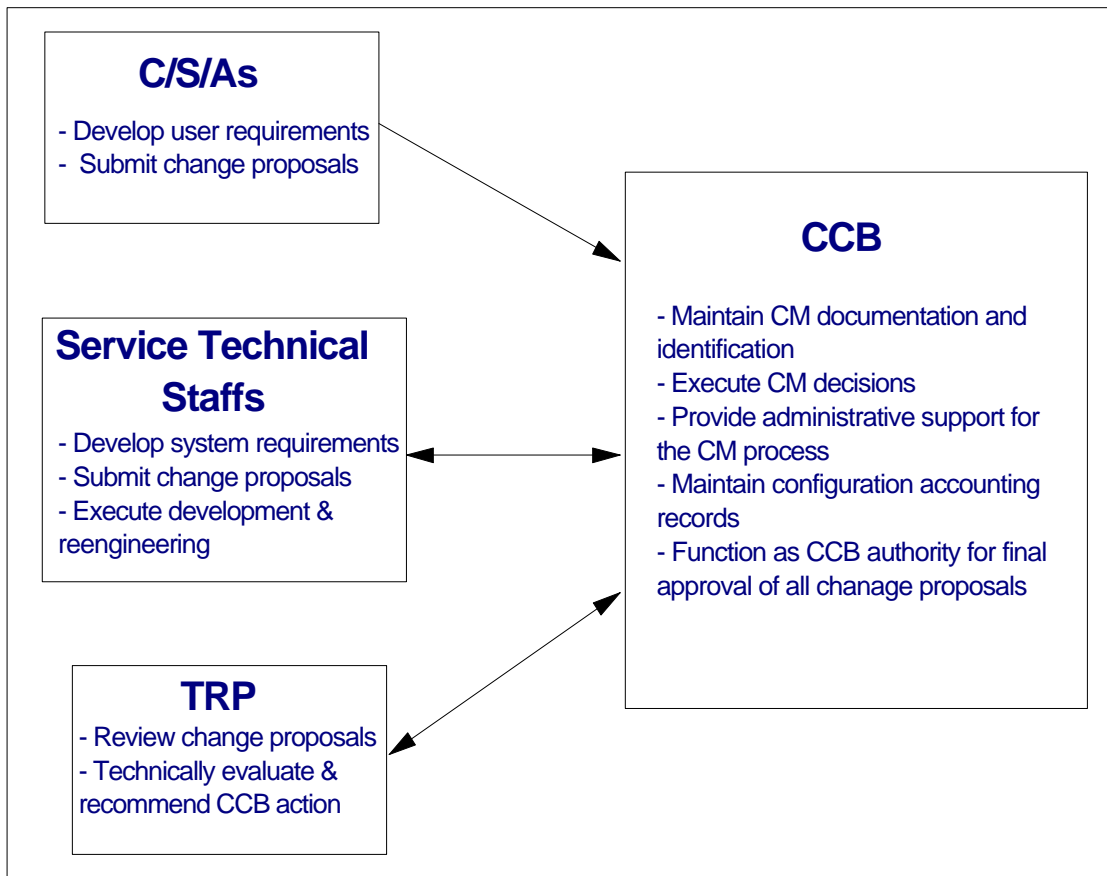


FIGURE 1. CM program structure.

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2.3 Symbology technical library. The symbology program, including the approved baselines for all C4I symbology activities, will be stored and maintained on the World Wide Web in Portable Document Format (PDF). The actual documentation supporting the symbology program will be stored at the facility which maintains the home page for DISA. The technical library will enable interested parties to access symbology information at any time.

2.4 Identification. The CCB is responsible for configuration identification of symbology. Configuration identification includes the selection of CIs, the determination of the types of documentation required for symbology development and maintenance, the issuance of version numbers and other identifiers affixed to the CI and CI documentation, the release of CIs and associated documentation, and the establishment of configuration baselines for CIs. Identification of software for configuration control will be determined based on the needs and requirements of the C/S/As and the C4I community.

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3. Change proposal and implementation process

3.1 Procedures for submitting a symbology change proposal This section provides the process for approving and implementing recommended changes to existing symbology development and maintenance. This process provides for the submission, coordination, evaluation, and disposition of CPs, to include a process for appeal and implementation. Figure 3-1 outlines the CP process. The CCB will define specific administrative and editorial requirements for the submission of CPs. This will include defining a priority system to communicate urgency for processing the CP and specified categories that define the CP. The CCB will specify time lines for submitting CPs and ensure sufficient time is allotted to process and distribute the CPs.

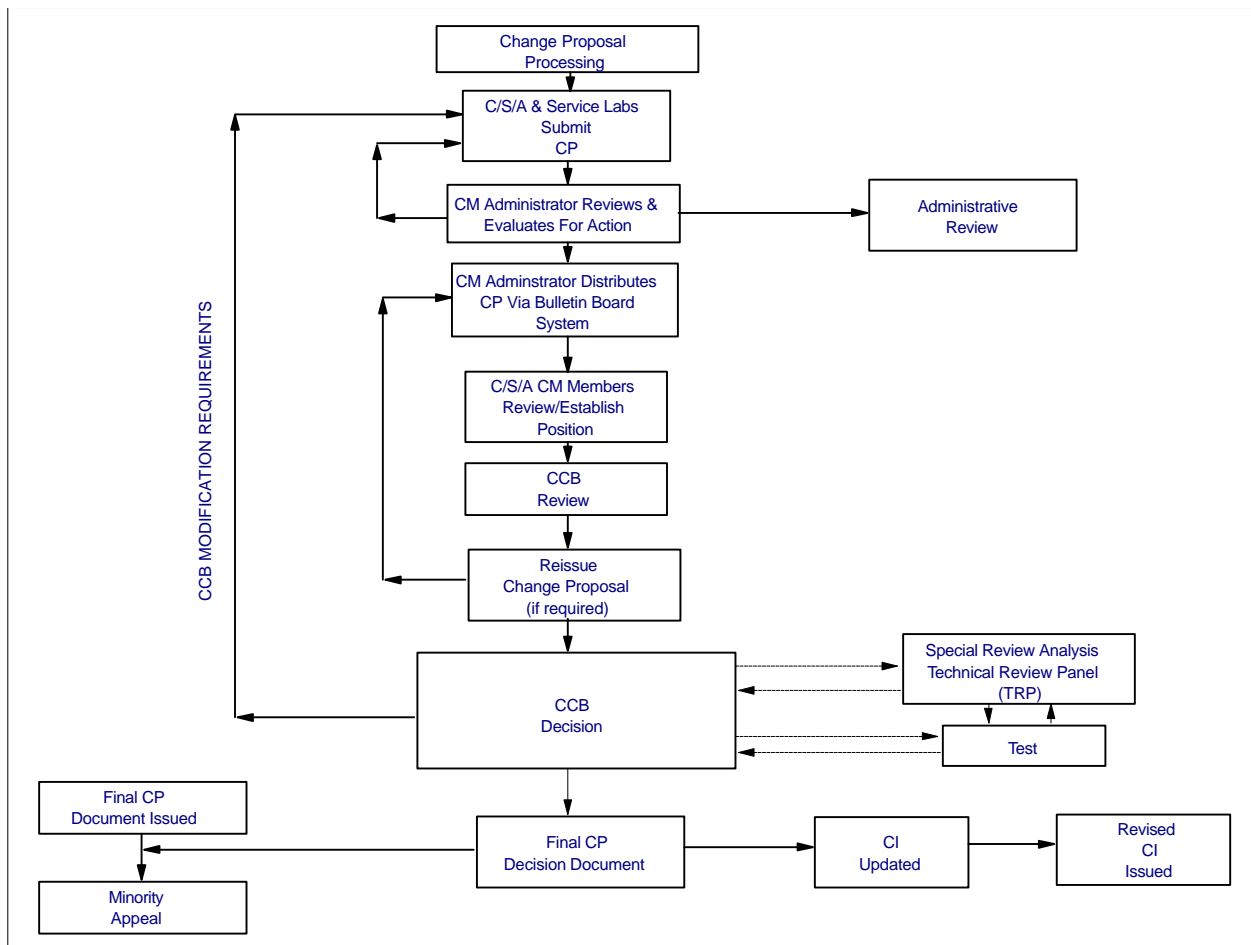


FIGURE 2. Change proposal process.

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3.2 Submission of a change proposal A CP may be generated by JIEO or C/S/As and their corresponding laboratories and technical staff. Each change proposal is submitted on a CP form (appendix C) through the appropriate C4I office designated by the C/S/As to the CCB. Submitters will complete the submitting organization and comment blocks and comply with the administrative procedures defined by the CCB. As a minimum, the change proposals will contain basic information that details a problem statement, a proposed solution, and an analysis of impacts (from the originator's perspective) on the identified baseline as well as other baselines. The CP will be placed in an area on the appropriate section of a bulletin board system (BBS) from which the SSMC members can upload electronic information for CM appreciation. These bulletin board areas provide a dedicated two way communication link between JIEO and the C/S/As to conduct CM work. Originators should check the bulletin board on a daily basis to insure that they have the most current status, and so that the opportunity to appeal decisions is not missed. Each of the C/S/As and JIEO has full access to upload and download CP information from these bulletin board areas. Once a CP is submitted, any change it may require must be submitted by the originator to the CCB. The CCB will incorporate the change if necessary.

3.3 The CCB administrative review and evaluation When the CM administrator becomes aware that a proposed CP has been electronically submitted by a C/S/A, it is downloaded for initial administrative review and control. The CM administrator reviews the CP to assess administrative completeness and correctness. When possible, the CM administrator will include any necessary administrative changes to the proposal after coordination with the originator, or simply return the CP to the originator for correction. At this point, the change is accepted by the CCB as a proposed change and the CP is given a sequential number for tracking purposes. Where extensive deviations to the prescribed procedures are found, the proposal is returned to the originator for corrective action and a resubmittal deadline of 90 days is assigned. CPs returned and not resubmitted within 90 days will be canceled automatically for audit purposes. A change proposal that is canceled may be resubmitted at the discretion of the originator; however, a new change proposal number will be used when resubmitting. Once the CP is administratively complete and correct, the CM administrator reviews the CP for technical adequacy and impact on other programs.

3.4 CCB distribution of a change proposal Upon completion of the administrative review and incorporation of required changes to make the proposed change accurate and complete, the change is placed on a BBS in a general area to which all interested parties to the baseline in question have access for downloading, but only the CM administrator or CCB chairman can upload. This restriction ensures the CM authority's ability to maintain the integrity of the CP as it continues through the review process. A broadcast message alerting all interested parties that a new CP is in the general area for review is sent over a messaging system, such as the Internet, addressed to all individuals on the SSMC distribution list. If issues arise in which the CM administrator cannot accept the CP as a proposed change, they will, concurrently to the process above, coordinate a formal CCB.

3.5 Review of the CP BY C/S/As The C/S/As are required to staff and evaluate the CP and

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forward their recommendations through a consolidation point to the C.B.. The C/S/A's evaluation must, as a minimum, evaluate the proposed change's impact on their systems, doctrine, and operating procedures. Additionally, the evaluation should ensure that the change is completely and properly integrated into the standard to maintain a clear and consistent baseline. Lastly, the evaluation should address the organization's intention and ability to implement the proposed change, differences in opinion concerning impact on other baselines, and requirements for testing. Consolidating points prepare a single evaluation for each CP and electronically submit it to the CCB through JIEO.

3.6 C.B. review. After receiving evaluations from all C/S/A consolidating points, or the passing of a predefined period of time, the C.B. will review each evaluation in detail for acceptable changes to the proposed solution from a joint perspective. Once the evaluations are accepted by the CCB, each is uploaded to the CM common area for member appreciation and later reference. If all CM members are in agreement and no substantive comments are received, the C.B. will assume participants' concurrence with the proposed change and will enter the CP as an approved item into the CI process. (The CM administrator will update the CP tracking log.)

3.7 Reissue Change Proposal. If the C/S/A reviews include substantive comments, the C.B. will examine the comments to determine if a revised CP could be produced that would increase the possibility of acceptance. If so, the CM administrator will update the proposed CP incorporating all acceptable changes, change the CP tracking number to indicate an updated version, update the CP tracking log, and upload the revised CP on the BBS for members to review in consideration of the C/S/A evaluations previously provided. The C/S/As will initiate a new round of evaluations and the consolidation of evaluations to develop a new position/evaluation on the revised CP. This new position will be uploaded for JIEO review and evaluation. This process will continue until the CP receives concurrence from all participants or until it is apparent that a consensus position cannot be achieved without a formal CCB meeting. In this case, the CP will be placed on a list of proposed changes for consideration at the next scheduled meeting of the C.B..

3.8 Final C.B. decision.

A CP decision may be achieved during CP processing through the achievement of a consensus of all principal members. In all other cases, a CP decision is accomplished during a C.B. meeting. Regardless of the form or location of these meetings, the C.B. will discuss the technical and policy merits of each proposed CP, consider the previously provided C/S/A evaluations of the CP, and dispose of the CP in one of five ways:

- a. Decide that more in-depth technical review and analysis is required and forward the CP to an existing technical body or form a technical body to consider the CP.
- b. Approve the CP for testing only. The C.B. will forward the CP to a testing agency, normally the Joint Interoperability Test Command (JITC), for conduct of interoperability testing. The results of the tests will be provided back to the CM body for review and action.

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- c. Agree with the problem statement but disagree with the proposed or alternate solution. In this case, the CP is returned to the originator for rework in consideration of member comments. The originator now develops new solution.
- d. Disapprove the CP and return it to the originator based on negative review analysis.
- e. Approve the CP and agree to an implementation date.

A CP decision notice is issued for each CP that has received final CM disposition (approval or disapproval) by the C.B.. This decision notice will detail the CP process and rationale leading to the C.B. approval or disapproval. While a CP decision is being prepared and distributed, the CP is converted by the CM administrator into a final version incorporating all approved changes. The final CP is incorporated into an interim baseline or processed for other agency coordination and distributed electronically to all members. The CP status log is updated.

Note: Initially, these meetings must take place at a central location with each principal and technical support in attendance. In the future, the possibility exists that TeleVideo conferencing will eliminate travel associated with face-to-face meetings. At the present time, most of the principal C.B. members do not have the necessary facilities to participate in such an electronic conference

3.8.1 TOP special review analysis A TOP is convened by the C.B. as required, for the purpose of clarifying questions or providing additional information. Input from the TOP is used to assist in determining if a CP is to be approved or disapproved.

3.9 Minority appeal. Any voting member in the minority of the CM decision may declare their position substantive at the time of the vote for appeal of the decision. Appeals must be submitted to the C.B. with full rationale to include the issue position and any other contrary view. The C.B. member representing the minority view must declare their position on a CP as substantive within **15 days**. Once a CP position is declared substantive, JIEO will request that one of the C/S/As representing the majority decision develop a document presenting the majority position. JIEO will review the minority and majority positions on the subject and develop a detailed consideration of all positions. Where resolution of the issue is time critical, JIEO will request a special convening of the appropriate standards body for issue resolution. No CP in the substantive appeal process will be processed further until the appeal is resolved.

3.10 Configuration status accounting The CFS establishes and maintains an electronic status accounting system (master log) to record symbology change proposals, provide an audit trail, and identify the current edition or version of baseline documents. The log is maintained by the CFS and is made available for review by C/S/As and other interested organizations.

3.10.1 CI updated. The timing of CP incorporation into the CI is dependent upon the CM cycle established by the C.B. . The CM cycle is based on the implementation cycle or schedule of impacted systems. Approved CPs are incorporated into an evolving or interim baseline to facilitate

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development and evaluation of subsequent CPs. The interim baseline has an implementation date established by the C.B.. A CP cannot be incorporated into the CI until it receives final approval by the CCB and a CP decision is issued.

3.10.2 Revised CI issued. A formal amendment or reissue of the baseline is developed and distributed by JIEO upon C.B. direction to update the baseline.

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APPENDIX A

GLOSSARY

A-1 ACRONYMS AND ABBREVIATIONS

ASD (C3I)	Assistant Secretary of Defense for Command, Control, Communications, and Intelligence
BBS	Bulletin Board System
C.B.	Configuration Control Board
CFS	Center for Standards
CI	Configuration Item
CIM	Corporate Information Management
CINC	Commander in Chief
CM	Configuration Management
CP	Change Proposal
C/S/A	CINC/Service/Agency
CSA	Configuration Status Accounting
C3I	Command, Control, Communications, and Intelligence
C4I	Command, Control, Communications, Computers, and Intelligence
DISA	Defense Information Systems Agency
DOD	Department of Defense
DODD	Department of Defense Directive
EA	Executive Agent
FSC	Federal Supply Code

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FSG	Federal Supply Group
INST	Information Standards
ITS	Information Technology Standards
ITSMP	Information Technology Standards Management Plan
JIEO	Joint Interoperability and Engineering Organization
JITC	Joint Interoperability Test Command
LSA	Lead Standardization Activity
MIL-STD	Military Standard
MOA	Memorandum of Agreement
NGS	Nongovernmental Standard
OSD	Office of the Secretary of Defense
PDF	Portable Document Format
SCC	Standards Coordinating Committee
SECDEF	Secretary of Defense
SITSMP	Symbology Information Technology Standards Management Plan
SSMC	Symbology Standards Management Committee
TOP	Technical Review Panel

A-2 DEFINITIONS

a. Configuration Baseline. The configuration baseline is the configuration documentation formally designated by the government at a specific time during a CI's life cycle. Configuration baselines, plus approved changes from those baselines, constitute the current approved configuration documentation.

b. Configuration Control. Configuration control is the systematic proposal, justification,

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evaluation, coordination, and approval or disapproval of proposed changes, and the implementation of all approved changes, in the configuration of a CI after the establishment of the configuration baseline(s) for the CI.

c. Configuration Control Board (C.B.) The C.B. is a board composed of technical and administrative representatives who recommend approval or disapproval of proposed engineering changes to a CI's current approved configuration documentation.

d. Configuration Identification Configuration identification includes the selection of CIs; the determination of the types of configuration documentation required for each CI; the issuance of numbers and other identifiers affixed to the CIs and to the technical documentation that defines the CI's configuration, including internal and external interfaces; the release of CIs and their associated configuration documentation; and the establishment of configuration baselines for CIs.

e. Configuration Item (CI) A configuration item is an aggregation of hardware or software that satisfies an end-use function and is designated by the government for separate configuration management.

f. Configuration Management (CM) As applied to configuration items, this is a discipline applying technical and administrative direction and surveillance during the life cycle of items to identify and document the functional and physical characteristics of configuration items; to control changes to items and documentation; to record and report information; and to audit items to verify conformance to specifications, drawings, interface control documents, and other contract requirements.

g. Configuration Status Accounting (CSA) CSA is the recording and reporting of information needed to manage configuration items effectively, including:

1. A record of the approved configuration documentation and identification numbers.
2. The status of proposed changes.
3. The implementation status of approved changes.
4. The configuration of all units of the CI in the operational inventory.

h. Coordination. Coordination is the process of having standardization documents reviewed and commented upon by government and private sector organizations.

i. Information Standards (INST). Information standards constitute the proposed standardization area that encompasses the development, coordination, and integration of standardized information components across all functional areas within the DOD. It includes report standards; data exchange format standards; operational instructions; symbology standards; and geographic,

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graphic, and imagery constructs.

j. Information Technology Standards (ITS). ITS are standards that provide technical definitions for information system processes, procedures, practices, operations, services, interfaces, connectivity, interoperability, information formats, interchange, and transmission or transfer. ITS apply during the development, testing, fielding, enhancement, and life cycle maintenance of DOD information systems.

k. Interoperability. Interoperability is the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces, and to use the services so exchanged to operate effectively together.

l. Standard. A standard is a document that establishes uniform engineering and technical requirements for processes, procedures, practices, and methods. Standards also may establish requirements for selection, application, and design criteria of material.

m. Standardization. Standardization is the process of developing and agreeing upon (by consensus or decision) uniform engineering criteria for products, processes, practices, and methods.

n. Standardization Areas. Standardization areas are categories for engineering technologies, disciplines, and practices that do not fall under a Federal Supply Code (FSC) or Federal Supply Group (FSG). The SD-I (reference I) identifies the Standardization Areas.

o. Standardization Document. "Standardization document" is a generic term for a document used to standardize an item of supply, process, procedure, method, data, practice, or engineering approach. Standardization documents include military specifications, standards, handbooks, bulletins, federal specifications and standards, guide specifications, and nongovernment standards (NGSs).

p. Standardization Program Plan. A standardization program plan is a document prepared by a Lead Standardization Activity (LSA) that identifies standardization opportunities, problems, and objectives, and establishes milestones for accomplishing standardization goals and specific tasks in a FSC, FSG, or standardization area.

q. Standardization Project. A standardization project is an effort approved by the cognizant LSA to develop, update, cancel, or adopt a standardization document, or conduct an item reduction study or engineering practice study.

r. Symbolology. Symbolology is a specifically defined sign used to represent an object or feature.

s. Warfighting Symbolology. Warfighting symbolology is used in the planning and execution of military operations in support of C4I functions and activities.

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APPENDIX B

REFERENCES

- a. JIEO Plan 3200, *Information Technology Standards Management Plan*, November 1993.
- b. OSD Memorandum, "Implementation of Corporate Information Management Principles," November 16, 1990.
- c. ASD(C3I) Memorandum for Director, Defense Information Systems Agency, "Executive Agent for DOD Information Standards," September 3, 1991.
- d. MIL-STD-973, *Configuration Management*, April 17, 1992.
- e. *Symbology Standards Management Committee (SSMC) Charter*, 5 March, 1996.
- f. DOD 5200.1-R, *Security Classification and Safeguards Program Regulation*, 1996.
- g. DODD 5230.9, *Clearance of DOD Information for Public Release*, April 9, 1996.
- h. JIEO, Configuration Management Policy, Global command and Control System (GCCS), April 3, 1995.

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APPENDIX C

CHANGE PROPOSAL FORM

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SYMBOLGY CONFIGURATION MANAGEMENT			
CHANGE PROPOSAL NUMBER		MIL94	
SUBMITTING ORGANIZATION		DATE RECEIVED	DATE OF ACTION
COMMENT			
JIEO ANALYSIS			
ACTION TAKEN			

ENCLOSURE 4

Appendix D

pg 80 - Icons such as "Wheeled armor amphibious recovery" should be rethought. Hank or Mike might have suggestions on improvements.

pg 82 - Air assault designation should be bigger

pg 83 - Arctic designator should have larger curves for visibility and discriminability from supply designator.

pg 118 - Make sawtooth on Sigint larger so it will not look like a "T" at smaller sizes.

pg 123-5 - Something needs to be done with text on signal units. I don't know what. Is this something Bob Gyger was going to look into? pg 149-50 - Class IX circle should be smaller and radial lines made bigger to make them visible.

pg 152-3 - "Pure" will be unreadable at smaller sizes. Suggest that purification be a text field adjunct to basic water supply symbol.

pg 205 - Make NBC designator smaller in frame, possibly black filled? pg 206 - Make land mine smaller and make "fuse lines" larger

pg 209 - Make Class IX designator in Equipment manufacture smaller.